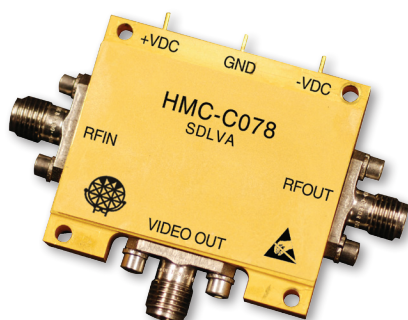




SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA) MODULE w/ LIMITED RF OUTPUT, 2 - 20 GHz

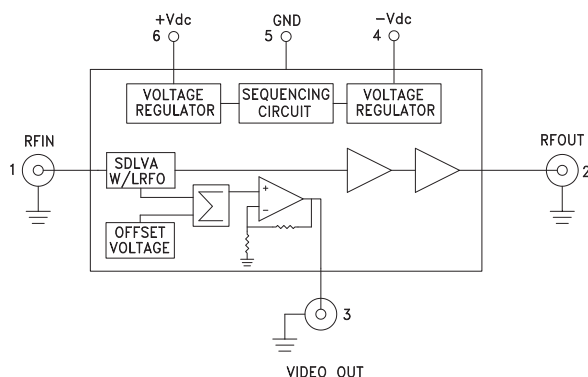


Typical Applications

The HMC-C078 is ideal for:

- EW, ELINT & IFM Receivers
- DF Radar Systems
- ECM Systems
- Broadband Test & Measurement
- Power Measurement & Control Circuits
- Military & Space Applications

Functional Diagram



Features

- Limited RF Output Power
- High Logging Range: 50 dB
- Output Frequency Flatness: ± 1 dB
- Internal Voltage Regulation
- Fast Rise/Fall Times: 5/8 ns
- Hermetically Sealed Module
- 55 °C to +85 °C Operating Temperature

General Description

The HMC-C078 is a Successive Detection Log Video Amplifier (SDLVA) which operates from 2 to 20 GHz. The HMC-C078 provides a logging range of 50 dB.

This product comes standard with two female SMA field replaceable connectors but can also be used with blind mate SMP connectors or as a drop-in module. The package size measures 1.5 x 1.32 x 0.23" (38.10 x 33.53 x 5.84 mm) making it ideal for environmentally robust applications where space is limited. In addition to the video output signal, the HMC-C078 has a limited RF output port.

The HMC-C078 has integrated voltage regulators on both the positive and negative supply.

Electrical Specifications, $T_A = +25^\circ\text{C}$ +Vdc = +12V, -Vdc = -7V

| Parameter | Conditions | Min | Typ. | Max | Units |
|----------------------------------|-----------------------------|-----|---------|-----|-------|
| Input Frequency Range | | | 2 - 20 | | GHz |
| Frequency Flatness | Pin= -25 dBm | | ± 1 | | dB |
| Log Linearity | Pin= -40 dBm to +0 dBm | | ± 1 | | dBm |
| Log Linearity over Temperature | -55 to +85° C, Pin= -25 dBm | | ± 1 | | dB |
| Minimum Logging Range | to ± 3 dB error | | -45 | | dBm |
| Maximum Logging Range | to ± 3 dB error | | 5 | | dBm |
| Input Return Loss | | | 8 | | dB |
| Output Return Loss | | | 15 | | dB |
| Small Signal Gain | | 40 | 44 | | dB |
| Saturated Output Power (10 GHz) | | 5 | 7 | 10 | dBm |
| Log Video Minimum Output Voltage | | 0.1 | 0.25 | 0.5 | V |
| Log Video Maximum Output Voltage | | 2.3 | 2.5 | 2.7 | V |

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HMC-C078* PRODUCT PAGE QUICK LINKS

Last Content Update: 11/29/2017

COMPARABLE PARTS

View a parametric search of comparable parts.

DOCUMENTATION

Data Sheet

- HMC-C078 Data Sheet

DESIGN RESOURCES

- HMC-C078 Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

DISCUSSIONS

View all HMC-C078 EngineerZone Discussions.

SAMPLE AND BUY

Visit the product page to see pricing options.

TECHNICAL SUPPORT

Submit a technical question or find your regional support number.

DOCUMENT FEEDBACK

Submit feedback for this data sheet.

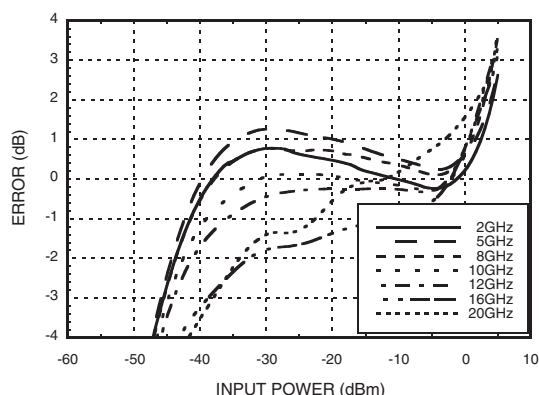


SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA) MODULE w/ LIMITED RF OUTPUT, 2 - 20 GHz

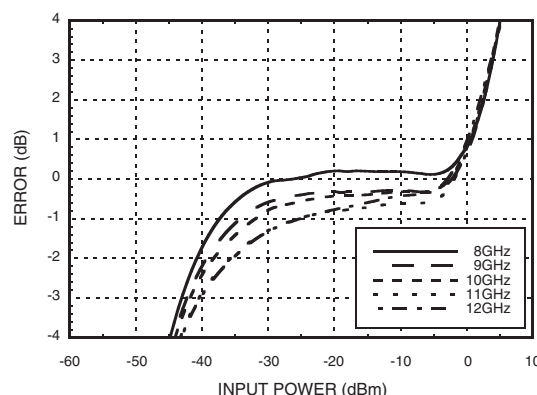
Electrical Specifications, (continued)

| Parameter | Conditions | Min | Typ. | Max | Units |
|---|---------------------------|-----|------|-----|--------------------------------|
| Tangential Signal Sensitivity (TSS) | 2 - 20 GHz, 20 MHz VBW | | -54 | | dBm |
| Log Video Output Rise Time | Pin = -20 dBm, 10% to 90% | | 5 | | ns |
| Log Video Output Fall Time | Pin = -20 dBm, 90% to 10% | | 8 | | ns |
| Log Video Recovery Time | -40 dBm to 0 dBm | | 25 | | ns |
| Log Video Output Slope | Pin = 35 dBm | 37 | 42 | 47 | mV/dB |
| Log Video Output Slope Variation over Temperature | @ 10 GHz | | 10 | | $\mu\text{V/dB}^\circ\text{C}$ |
| Log Video Propagation Delay | | | 20 | | ns |
| +Vdc Voltage Range | | 9 | 12 | 15 | V |
| -Vdc Voltage Range | | -6 | -7 | -15 | V |
| Supply Current (+Idc) | | | 370 | 400 | mA |
| Supply Current (-Idc) | | | 20 | | mA |

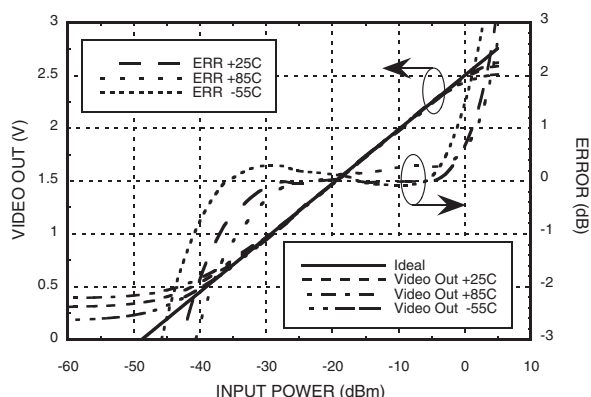
Error Flatness vs. Input Power Over Frequency



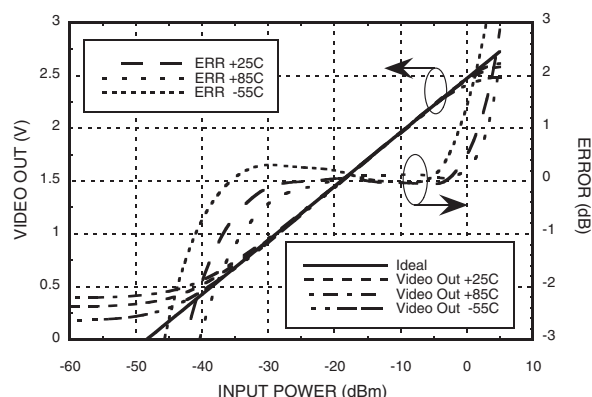
X-Band Error Flatness vs. Input Power Over Frequency



VIDEO OUT & Error vs. Input Power, Fin = 2 GHz



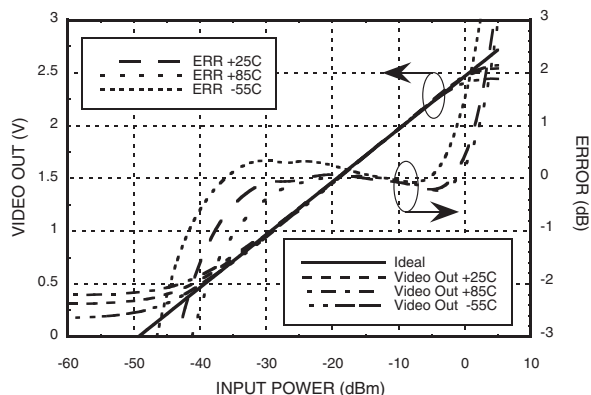
VIDEO OUT & Error vs. Input Power, Fin = 5 GHz



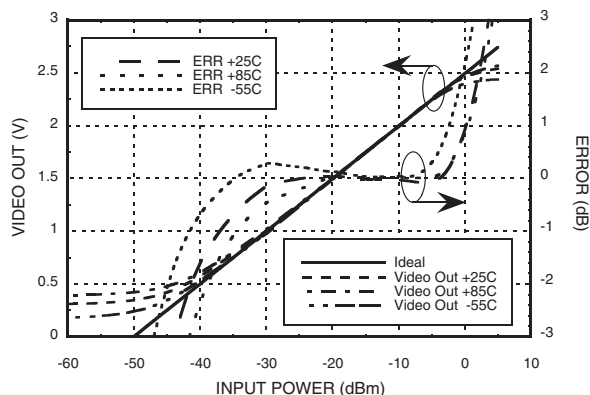


SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA) MODULE w/ LIMITED RF OUTPUT, 2 - 20 GHz

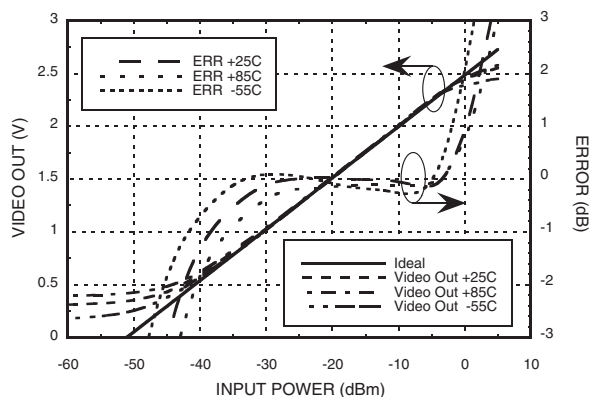
**VIDEO OUT & Error
vs. Input Power, $F_{in} = 8$ GHz**



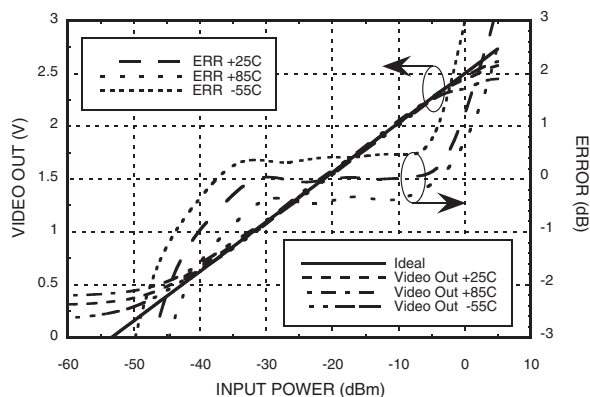
**VIDEO OUT & Error
vs. Input Power, $F_{in} = 10$ GHz**



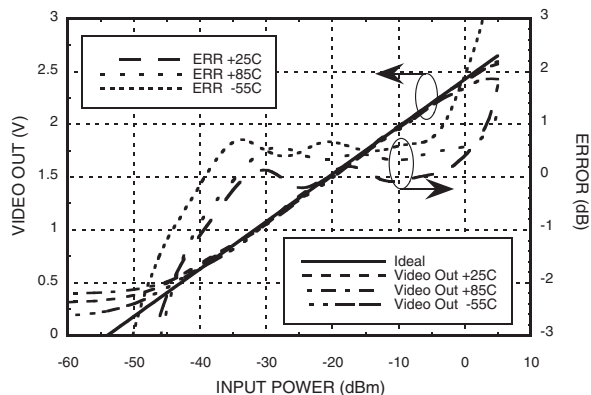
**VIDEO OUT vs. Error
vs. Input Power, $F_{in} = 12$ GHz**



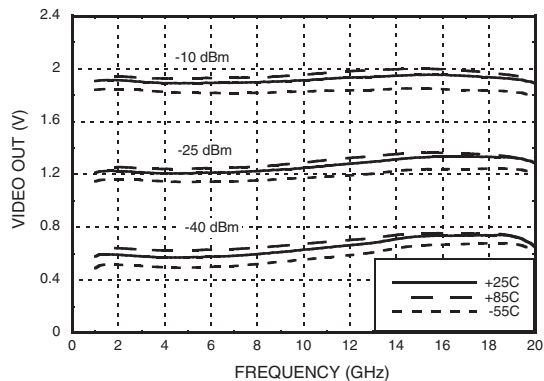
**VIDEO OUT & Error
vs. Input Power, $F_{in} = 16$ GHz**



**VIDEO OUT & Error
vs. Input Power, $F_{in} = 20$ GHz**



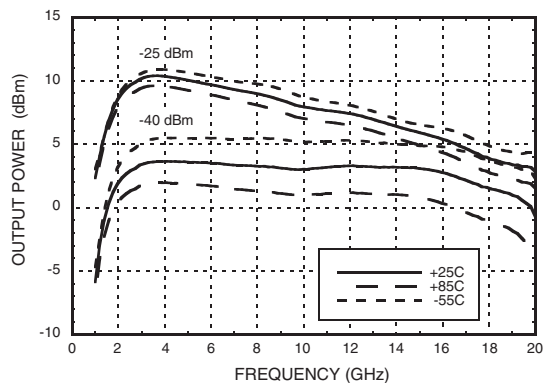
**VIDEO OUT vs. Frequency
Over Input Power & Temperature**



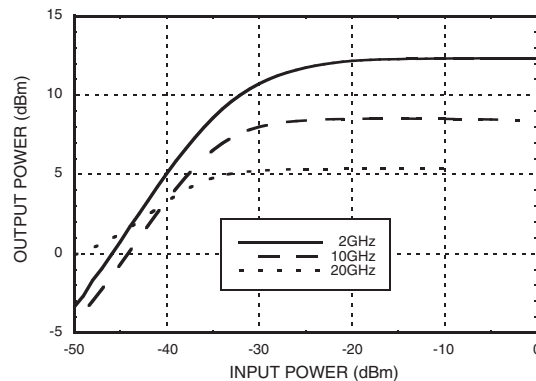


SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA) MODULE w/ LIMITED RF OUTPUT, 2 - 20 GHz

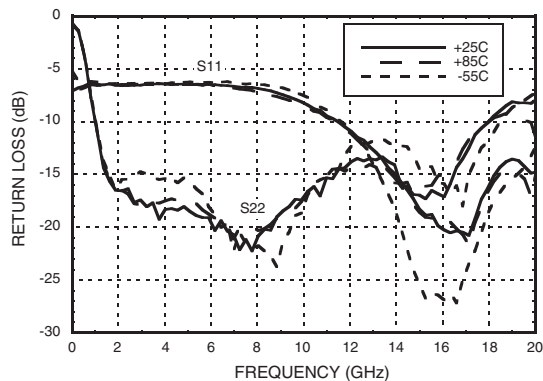
**Output Power vs. Frequency
Over Input Power & Temperature**



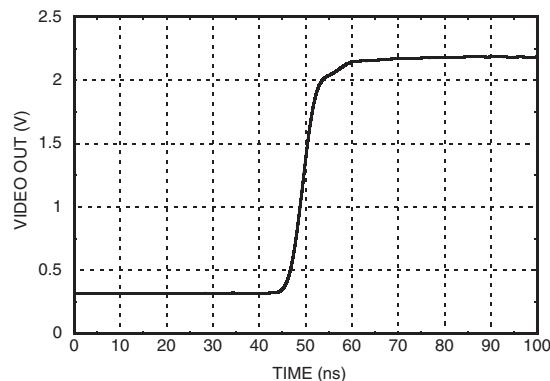
Output Power vs. Input Power



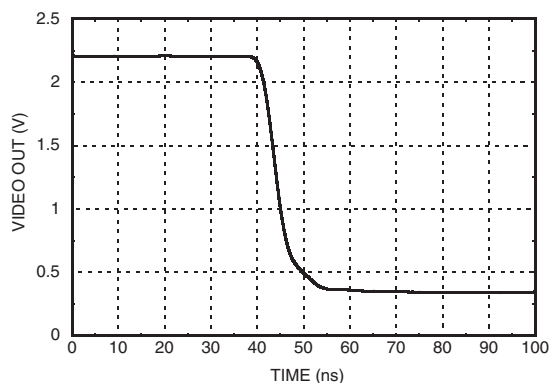
Return Loss vs. Frequency



Rise Time @ 10 GHz @ -20 dBm



Fall Time @ 10 GHz @ -20 dBm



Absolute Maximum Ratings

| | |
|---|----------------|
| RF Input Power | +10 dBm |
| Junction Temperature | 125 °C |
| Continuous P _{diss} (T=85°C) | 6.3 W |
| +V _{dc} | +15V |
| -V _{dc} | -15V |
| Storage Temperature | -65 to +150 °C |
| Operating Temperature | -55 to +85 °C |
| ESD Sensitivity (HBM) | Class 0 |
| HMC-C078 is a Class 0 ESD sensitive part. RF input and RF output pass 50V ESD HBM exposure. | |

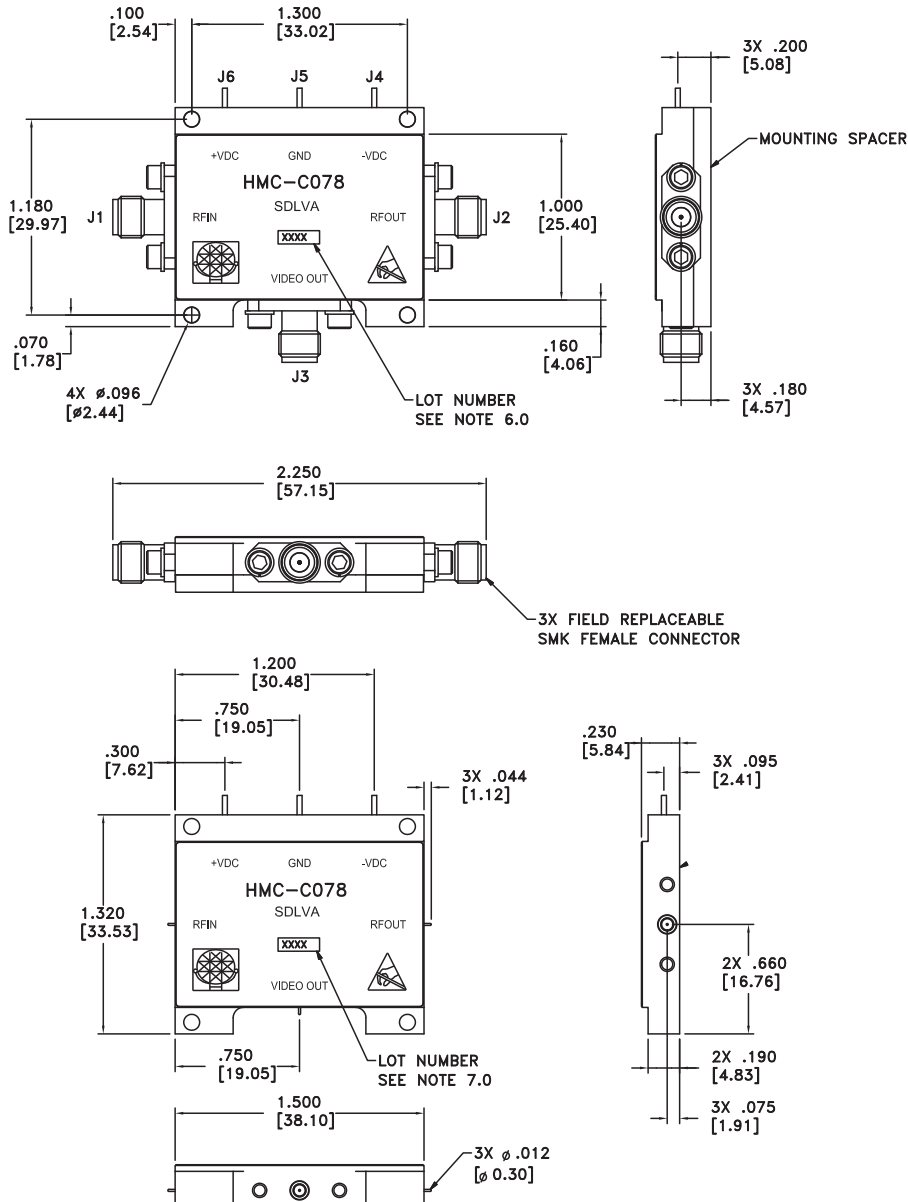


**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**



SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA) MODULE w/ LIMITED RF OUTPUT, 2 - 20 GHz

Outline Drawing



VIEW SHOWN WITH CONNECTORS REMOVED

Package Information

| | |
|--------------------|----------|
| Package Type | C-21 |
| Package Weight [1] | 39.5 gms |
| Spacer Weight | 8.5 gms |

[1] Includes the connectors

[2] ±1 gms Tolerance

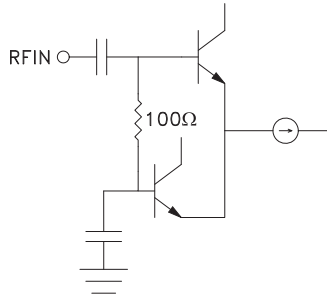
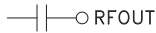
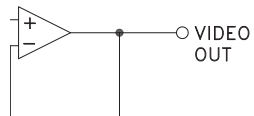
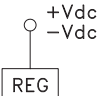

NOTES:

- 1.0 PACKAGE, LEADS COVER MATERIAL: KOVAR
- 2.0 FINISH: GOLD PLATE OVER NICKEL PLATE.
- 3.0 MOUNTING SPACER: NICKEL PLATED ALUMINUM.
- 4.0 ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].
- 5.0 TOLERANCES:
- 5.1 .XX = ±.02 [0.5 mm]
- 5.1 .XXX = ±.010 [0.25 mm]
- 6.0 MARK LOT NUMBER ON .080 X .250 LABEL APPROXIMATELY WHERE SHOWN, WITH .030 MINIMUM TEXT HEIGHT.
- 7.0 USE MOUNTING SPACER PART NUMBER 125177.



SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA) MODULE w/ LIMITED RF OUTPUT, 2 - 20 GHz

Pin Descriptions

| Pin Number | Function | Description | Interface Schematic |
|------------|------------|--|---|
| 1 | RFIN | RF Input pin. |  |
| 2 | RFOUT | This pin is AC coupled and matched to 50 Ohms |  |
| 3 | VIDEO OUT | Video Out is a voltage that is proportional to the log of the Input Power. (50 Ohm optimal load) |  |
| 4, 6 | -Vdc, +Vdc | Bias Supply. |  |
| 5 | GND | This pin must be connected to a high quality RF/DC ground. |  |